

Project Update: July 2011

Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

In the previous experimental setup, we characterised soil and microclimate conditions, hydrological dynamic, and remnant vegetation in 10 restoration plots, in five *ejidos*. We selected 8 species for restoration; seeds were collected and more than 1000 native plants were propagated in a nursery constructed by the project. A total of 800 plants were transplanted to the 10 plots October 2010. To evaluate the importance of the environmental filters, plots were divided into four conditions: (1) control, (2) grass removal, (3) soil decompaction and, (4) both removal and de-compaction. Plants were transplanted to these conditions in equal numbers. Plant survival and growth were monitored frequently but we have still not finished the analysis. Finally, in September 2011 we are scheduled to transplant another 600 native trees.

First, we carried out vegetation censuses in natural and secondary riparian vegetation. Second, we reviewed literature about the ecological characteristics of the species founded in those censuses. Third, we developed four workshops in four *ejidos* to involve and consult local communities about suitable species for restoration and to decide the location of the restoration plots. Four, we integrated ecological and social information in a "Selection Species Index", which allowed us to list 40 potential species for restoration purposes. We expected this index could be considered in the near future to select species in other tropical regions. These results will be presented in the 4th World Conference on Ecological Restoration and considered for their publication in the Restoration Ecology Journal.

We reviewed the literature about functional traits and their potential as indicators of demography and other population characteristics. At this moment we are looking for specific literature about the functional traits of the species we are using. We expect to analyse their association with survival, growth and establishment of our species in the restoration plots. This objective depends on the progress of the objective one.

Although a restoration protocol was not considered as a specific objective of this project, we expect to contribute in developing this protocol at least in the first steps. For instance we expect as a final product of this project to recommend at least 20 species with a potential use for restoration purposes, and the effective technique for their propagation and manipulation.

Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

Because all restoration plots are active pastures and some stands adjacent with other land owners, fences were constructed to prevent livestock entry. However, livestock attacked most of the experimental plots affecting tree survival during dry season, when food is scarce. At the same time, although we established a verbal agreement with land owners to look after the plants, two plots plant marks were stolen.

These two difficulties forced us to reinforce fences and replace plant marks. We also have decided to replant native trees again in September 2011. Therefore, we decided not to purchase the digital camera and laptop and we reallocate those funds to “Material and supplies”, for the continuity of field work.

Dr. Rey Benayas was invited to participate in the III National Congress of Ecology, last April 2011 in Veracruz, Mexico. Therefore, the funds considered for the technical visit to Spain were not necessary. These remnant funds will be used for the last field visit programmed for September 2011, and to assist next August 2011 to the 4th World Conference in Ecological Restoration, organized by the Society for Ecological Restoration (SER) in Merida, Yucatán, Mexico. During this meeting we are going to present some results mainly from the Chapter 2 of this project in two oral contributions.

Briefly describe the three most important outcomes of your project.

- Social perceptions about the most suitable species for restoration of riparian vegetation did not coincide with the most abundant and frequent species detected in the censuses. It means that the species selection could reach different outcomes when using ecological or social criteria. It remarks the importance to integrate ecological and social criteria when selecting species for restoration.
- The information about collection and propagation of riparian species are scarce. Therefore we recommend promoting a new project focused in the collection, germination and propagation of these species, in order to contribute future restoration aims.
- At the moment, our data suggest that competition with remnant vegetation could be an important factor that limits tree establishment, instead of soil compaction.

Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

Local communities were involved in the processes of selecting restoration sites and species. They have actively participated in four workshops developed in four *ejidos*, where we discussed about the suitable species for riparian restoration. We carried out four reunions more which aimed to bring together local people interested in the riparian restoration project. During these reunions we were able to identify those land owners willing to cede a part of their land for the restoration purposes. Finally, during these workshops we arranged with the selected land owners visits to each of the plots in their company.

Mesoamerican Biologic Corridor (CBMM in Spanish [www.cbmm.gob.mx]) invited us to disseminate our knowledge and results in a technical publication. We developed a “technical manual” titled: “*Ecological Restoration of riparian vegetation. Manual for the recovery of riparian vegetation of streams in Lacandona rainforest*”. This manual is already published and will be available as a *pdf* version in the web page of CBMM. The language of the manual is intended to be simple and understandable for local communities. It has been distributed in the five *ejidos* where we are working. We expect that the information included in the manual would be useful for local communities interested in the recovery of riparian vegetation.

Are there any plans to continue this work?

Yes. This project constitutes part of my PhD Thesis which will continue for 2 more years. During the following years we expect to: (1) evaluate the recovery of ecosystem services of riparian vegetation and streams after restoration, (2) evaluate the recovery of ecosystem services of river, streams and other wetlands, (3) evaluate restoration at a landscape level, and (4) develop medium-term indicators of restoration success.

Besides, we are planning to carry out new workshops to share with local communities the final results of this project during the course of the year 2013.

How do you plan to share the results of your work with others?

As detailed in question 4, a technical publication could be part of the information of this project as a *manual*. This information is available to local communities, local governments and other stakeholders, including non-governmental organisations. We expect to develop also a manuscript about the importance of conservation and restoration of riparian vegetation for a general audience.

At the same time, the results of this project will be shared with the scientific community through the publication of several research papers in specialised journals and the participation in scientific events (as congresses or meetings). During the next 2 years we expect to obtain the following specific products:

Objective 1: *Riparian restoration: Importance of environmental filters in re-vegetation success* (Objective 1). The results will be summarised in one manuscript that will be submitted to *Biological Conservation* or *Ecological Restoration*.

Objective 2: *Species selection for restoration: The importance of considering multiple criteria*. The results of this objective will constitute an oral presentation in the 4th World Conference on Ecological Restoration, and a manuscript submitted to *Restoration Ecology*.

Objective 3: *Functional traits as indicators of re-vegetation success in restoration projects*. This information will be summarized in a scientific paper, maybe submitted to the *Journal of Vegetation Science*.

Timescale: Over what period was the RSG used? How does this compare to the anticipated or actual length of the project?

The RSG was used between April 2010 and October 2011. As we detailed in question 5, this project is part of a PhD Thesis which will continue for 2 more years. We have some funding already secured by the project "*Restauración ambiental en Marqués de Comillas para favorecer la conservación de selva y aumentar la conectividad del paisaje a través de la recuperación de riberas*", developed by Natura y Ecosistemas Mexicanos A.C. Natura cover part of costs of field assistant, equipment, field work and others, but it will be necessary other financial support. To continue funding this project after the RSG finished we are

considering applying for a WWF grant or for a second RSG. Our aim is to convert this 2-year project in a long-term study.

Looking ahead, what do you feel are the important next steps?

We think that is crucial to continue working with local communities because they are the owners of the land and the natural resources. It is also important to bring them more information about the importance of riparian vegetation for the maintenance of the natural dynamics of the ecosystems and landscape of the rainforest, and for the maintenance of human well-being. The valuation of the recovery of ecosystem services of riparian vegetation through restoration could be a good way to demonstrate this importance.

On the other hand, although it is beyond of the objectives of this project, we think it is necessary to develop and evaluate good indicators of the restoration goals, not only at a local level but also at landscape and watershed level.

Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

Yes. RSGF logo was used in two posters presented in the III National Congress of Ecology and Meeting of the Mexican Scientific Society of Ecology (SCME, in Spanish), in April 2011 in Veracruz, Mexico. It will be used in two oral presentations in the World Conference on Ecological Restoration, by Society for Ecological Restoration (SER) in August 2011, in Mérida, Mexico. RSGF Logo was also included in the reports of the organisation I represent (Natura), as other institutions that provide financial support.

Any other comments?

We are grateful to Rufford Small Grant Foundation for supporting our project and for being interested in Lacandona rainforest. We want to emphasise that the flexibility in the use of the funds was critical to obtain results. This is particularly important for our work in Marqués de Comillas, an isolated region where the logistics of field work sometimes can be complicated.



